

09/719379

JC05 R PCT/PTO 1 1 DEC 2000

## SEQUENCE LISTING

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Yves Lobet  
Guy Dequesne  
Lauren Bakaletz

<120> Vaccine

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gta cta gca ggt tgt agc agc cat tca tca aat atg gcg aat acc caa 156  
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atg aaa tca gac aaa atc att att gct cac cgt ggt gct agc ggt tat 204  
 Met Lys Ser Asp Lys Ile Ile Ile Ala His Arg Gly Ala Ser Gly Tyr  
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tta cca gag cat acg tta gaa tct aaa gca ctt gcg ttt gca caa cag 252  
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gct gat tat tta gag caa gat tta gca atg act aag gat ggt cgt tta 300  
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gtg gtt att cac gat cac ttt tta gat ggc ttg act gat gtt gcg aaa 348  
 Val Val Ile His Asp His Phe Leu Asp Gly Leu Thr Asp Val Ala Lys  
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aaa ttc cca cat cgt cat cgt aaa gat ggc cgt tac tat gtc atc gac 396  
 Lys Phe Pro His Arg His Arg Lys Asp Gly Arg Tyr Tyr Val Ile Asp  
 95 100 105 110

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115

120

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Trp Lys Ser His Phe Arg Ile His Thr Phe Glu Asp Glu Ile Glu Phe	
145 150 155	
atc caa ggc tta gaa aaa tcc act ggc aaa aaa gta ggg att tat cca	588
Ile Gln Gly Leu Glu Lys Ser Thr Gly Lys Lys Val Gly Ile Tyr Pro	
160 165 170	
gaa atc aaa gca cct tgg ttc cac cat caa aat ggt aaa gat att gct	636
Glu Ile Lys Ala Pro Trp Phe His His Gln Asn Gly Lys Asp Ile Ala	
175 180 185 190	
gct gaa acg ctc aaa gtg tta aaa aaa tat ggc tat gat aag aaa acc	684
Ala Glu Thr Leu Lys Val Leu Lys Lys Tyr Gly Tyr Asp Lys Lys Thr	
195 200 205	
gat atg gtt tac tta caa act ttc gat ttt aat gaa tta aaa cgt atc	732
Asp Met Val Tyr Leu Gln Thr Phe Asp Phe Asn Glu Leu Lys Arg Ile	
210 215 220	
aaa acg gaa tta ctt cca caa atg gga atg gat ttg aaa tta gtt caa	780
Lys Thr Glu Leu Leu Pro Gln Met Gly Met Asp Leu Lys Leu Val Gln	
225 230 235	
tta att gct tat aca gat tgg aaa gaa aca caa gaa aaa gac cca aag	828
Leu Ile Ala Tyr Thr Asp Trp Lys Glu Thr Gln Glu Lys Asp Pro Lys	
240 245 250	
ggt tat tgg gta aac tat aat tac gat tgg atg ttt aaa cct ggt gca	876
Gly Tyr Trp Val Asn Tyr Asn Tyr Asp Trp Met Phe Lys Pro Gly Ala	
255 260 265 270	
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Met Ala Glu Val Val Lys Tyr Ala Asp Gly Val Gly Pro Gly Trp Tyr	
275 280 285	
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Pro Leu Val Lys Glu Leu Ala Gln Tyr Asn Val Glu Val His Pro Tyr	
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acc gtg cgt aaa gat gca ctg ccc gag ttt ttc aca gac gta aat caa	1068
Thr Val Arg Lys Asp Ala Leu Pro Glu Phe Phe Thr Asp Val Asn Gln	
320 325 330	
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Met Tyr Asp Ala Leu Leu Asn Lys Ser Gly Ala Thr Gly Val Phe Thr	
335 340 345 350	
gat ttc cca gat act ggc gtg gaa ttc tta aaa gga ata aaa tcc atg	1164
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Met Lys Ser Asp Lys Ile Ile Ile Ala His Arg Gly Ala Ser Gly Tyr	
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65 70 75	
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Val Val Ile His Asp His Phe Leu Asp Gly Leu Thr Asp Val Ala Lys	
80 85 90	
aaa ttc cca cat cgt cat cgt aaa gat ggc cgt tac tat gtc atc gac	396
Lys Phe Pro His Arg His Arg Lys Asp Gly Arg Tyr Tyr Val Ile Asp	
95 100 105 110	
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acc aaa gat ggc aaa caa gcg caa gtt tat cct aat cgt ttc cct ctt	492
Thr Lys Asp Gly Lys Gln Ala Gln Val Tyr Pro Asn Arg Phe Pro Leu	
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Trp Lys Ser His Phe Arg Ile His Thr Phe Glu Asp Glu Ile Glu Phe	
145 150 155	
atc caa ggc tta gaa aaa tcc act ggc aaa aaa gta ggg att tat cca	588
Ile Gln Gly Leu Glu Lys Ser Thr Gly Lys Lys Val Gly Ile Tyr Pro	
160 165 170	
gaa atc aaa gca cct tgg ttc cac cat caa aat ggt aaa gat att gct	636
Glu Ile Lys Ala Pro Trp Phe His His Gln Asn Gly Lys Asp Ile Ala	
175 180 185 190	
gct gaa acg ctc aaa gtg tta aaa aaa tat ggc tat gat aag aaa acc	684

Ala	Glu	Thr	Leu	Lys	Val	Leu	Lys	Lys	Tyr	Gly	Tyr	Asp	Lys	Lys	Thr		
				195					200						205		
gat	atg	gtt	tac	tta	caa	act	ttc	gat	ttt	aat	gaa	tta	aaa	cgt	atc		732
Asp	Met	Val	Tyr	Leu	Gln	Thr	Phe	Asp	Phe	Asn	Glu	Leu	Lys	Arg	Ile		
			210					215					220				
aaa	acg	gaa	tta	ctt	cca	caa	atg	gga	atg	gat	ttg	aaa	tta	gtt	caa		780
Lys	Thr	Glu	Leu	Leu	Pro	Gln	Met	Gly	Met	Asp	Leu	Lys	Leu	Val	Gln		
		225					230					235					
tta	att	gct	tat	aca	gat	tgg	aaa	gaa	aca	caa	gaa	aaa	gac	cca	aag		828
Leu	Ile	Ala	Tyr	Thr	Asp	Trp	Lys	Glu	Thr	Gln	Glu	Lys	Asp	Pro	Lys		
	240					245					250						
ggt	tat	tgg	gta	aac	tat	aat	tac	gat	tgg	atg	ttt	aaa	cct	ggt	gca		876
Gly	Tyr	Trp	Val	Asn	Tyr	Asn	Tyr	Asp	Trp	Met	Phe	Lys	Pro	Gly	Ala		
255				260					265						270		
atg	gca	gaa	gtg	gtt	aaa	tat	gcc	gat	ggt	gtt	ggc	cca	ggt	tgg	tat		924
Met	Ala	Glu	Val	Val	Lys	Tyr	Ala	Asp	Gly	Val	Gly	Pro	Gly	Trp	Tyr		
				275				280						285			
atg	tta	gtt	aat	aaa	gaa	gaa	tcc	aaa	cct	gat	aat	att	gtg	tac	act		972
Met	Leu	Val	Asn	Lys	Glu	Glu	Ser	Lys	Pro	Asp	Asn	Ile	Val	Tyr	Thr		
			290					295					300				
ccg	ttg	gta	aaa	gaa	ctt	gca	caa	tat	aat	gtg	gaa	gtg	cat	cct	tac		1020
Pro	Leu	Val	Lys	Glu	Leu	Ala	Gln	Tyr	Asn	Val	Glu	Val	His	Pro	Tyr		
		305					310					315					
acc	gtg	cgt	aaa	gat	gca	ctg	ccc	gag	ttt	ttc	aca	gac	gta	aat	caa		1068
Thr	Val	Arg	Lys	Asp	Ala	Leu	Pro	Glu	Phe	Phe	Thr	Asp	Val	Asn	Gln		
	320					325					330						
atg	tat	gat	gcc	tta	ttg	aat	aaa	tca	ggg	gca	aca	ggt	gta	ttt	act		1116
Met	Tyr	Asp	Ala	Leu	Leu	Asn	Lys	Ser	Gly	Ala	Thr	Gly	Val	Phe	Thr		
335					340					345				350			
gat	ttc	cca	gat	act	ggc	gtg	gaa	ttc	tta	aaa	gga	ata	aaa	tcc	atg		1164
Asp	Phe	Pro	Asp	Thr	Gly	Val	Glu	Phe	Leu	Lys	Gly	Ile	Lys	Ser	Met		
				355				360						365			
gat	ggt	ggc	aaa	gca	ggt	gtt	gct	tta	gta	cgt	tct	gat	tat	aaa	ttt		1212
Asp	Gly	Gly	Lys	Ala	Gly	Val	Ala	Leu	Val	Arg	Ser	Asp	Tyr	Lys	Phe		
			370					375					380				
tat	gaa	gat	gca	aac	ggt	act	cgt	gac	cac	aag	aaa	ggt	cgt	cac	aca		1260
Tyr	Glu	Asp	Ala	Asn	Gly	Thr	Arg	Asp	His	Lys	Lys	Gly	Arg	His	Thr		
		385					390					395					
gca	cgt	act	agt	ggc	cac	cat	cac	cat	cac	cat	taatctagaa	tcgataagct					1313
Ala	Arg	Thr	Ser	Gly	His	His	His	His	His	His							
	400					405											
tcgaccgatg	cc																1325

<210> 77

<211> 409

<212> PRT

<213> Haemophilus influenzae - see Figure 3



<400> 77

Met	Asp	Pro	Lys	Thr	Leu	Ala	Leu	Ser	Leu	Leu	Ala	Ala	Gly	Val	Leu
1				5					10					15	
Ala	Gly	Cys	Ser	His	Ser	Ser	Asn	Met	Ala	Asn	Thr	Gln	Met	Lys	
			20				25					30			
Ser	Asp	Lys	Ile	Ile	Ile	Ala	His	Arg	Gly	Ala	Ser	Gly	Tyr	Leu	Pro
		35				40					45				
Glu	His	Thr	Leu	Glu	Ser	Lys	Ala	Leu	Ala	Phe	Ala	Gln	Gln	Ala	Asp
		50				55				60					
Tyr	Leu	Glu	Gln	Asp	Leu	Ala	Met	Thr	Lys	Asp	Gly	Arg	Leu	Val	Val
65					70				75						80
Ile	His	Asp	His	Phe	Leu	Asp	Gly	Leu	Thr	Asp	Val	Ala	Lys	Lys	Phe
				85					90					95	
Pro	His	Arg	His	Arg	Lys	Asp	Gly	Arg	Tyr	Tyr	Val	Ile	Asp	Phe	Thr
			100					105					110		
Leu	Lys	Glu	Ile	Gln	Ser	Leu	Glu	Met	Thr	Glu	Asn	Phe	Glu	Thr	Lys
		115					120					125			
Asp	Gly	Lys	Gln	Ala	Gln	Val	Tyr	Pro	Asn	Arg	Phe	Pro	Leu	Trp	Lys
		130				135					140				
Ser	His	Phe	Arg	Ile	His	Thr	Phe	Glu	Asp	Glu	Ile	Glu	Phe	Ile	Gln
145					150					155					160
Gly	Leu	Glu	Lys	Ser	Thr	Gly	Lys	Lys	Val	Gly	Ile	Tyr	Pro	Glu	Ile
				165					170					175	
Lys	Ala	Pro	Trp	Phe	His	His	Gln	Asn	Gly	Lys	Asp	Ile	Ala	Ala	Glu
			180					185					190		
Thr	Leu	Lys	Val	Leu	Lys	Lys	Tyr	Gly	Tyr	Asp	Lys	Lys	Thr	Asp	Met
		195					200					205			
Val	Tyr	Leu	Gln	Thr	Phe	Asp	Phe	Asn	Glu	Leu	Lys	Arg	Ile	Lys	Thr
		210				215					220				
Glu	Leu	Leu	Pro	Gln	Met	Gly	Met	Asp	Leu	Lys	Leu	Val	Gln	Leu	Ile
225					230					235					240
Ala	Tyr	Thr	Asp	Trp	Lys	Glu	Thr	Gln	Glu	Lys	Asp	Pro	Lys	Gly	Tyr
				245					250					255	
Trp	Val	Asn	Tyr	Asn	Tyr	Asp	Trp	Met	Phe	Lys	Pro	Gly	Ala	Met	Ala
			260				265						270		
Glu	Val	Val	Lys	Tyr	Ala	Asp	Gly	Val	Gly	Pro	Gly	Trp	Tyr	Met	Leu
		275					280					285			
Val	Asn	Lys	Glu	Glu	Ser	Lys	Pro	Asp	Asn	Ile	Val	Tyr	Thr	Pro	Leu
		290				295					300				
Val	Lys	Glu	Leu	Ala	Gln	Tyr	Asn	Val	Glu	Val	His	Pro	Tyr	Thr	Val
305					310					315					320
Arg	Lys	Asp	Ala	Leu	Pro	Glu	Phe	Phe	Thr	Asp	Val	Asn	Gln	Met	Tyr
				325					330					335	
Asp	Ala	Leu	Leu	Asn	Lys	Ser	Gly	Ala	Thr	Gly	Val	Phe	Thr	Asp	Phe
			340					345					350		
Pro	Asp	Thr	Gly	Val	Glu	Phe	Leu	Lys	Gly	Ile	Lys	Ser	Met	Asp	Gly
		355					360					365			
Gly	Lys	Ala	Gly	Val	Ala	Leu	Val	Arg	Ser	Asp	Tyr	Lys	Phe	Tyr	Glu
		370				375					380				
Asp	Ala	Asn	Gly	Thr	Arg	Asp	His	Lys	Lys	Gly	Arg	His	Thr	Ala	Arg
385					390					395					400
Thr	Ser	Gly	His	His	His	His	His	His							
				405											

<210> 78

<211> 1442

<212> DNA

<213> Haemophilus influenzae - see Figure 4

<220>

<221> CDS

<222> (67)...(1411)

<400> 78

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taacat atg gat cca aaa act tta gcc ctt tct tta tta gca gct ggc	108
Met Asp Pro Lys Thr Leu Ala Leu Ser Leu Leu Ala Ala Gly	
1 5 10	
gta cta gca ggt tgt agc agc cat tca tca aat atg gcg aat acc caa	156
Val Leu Ala Gly Cys Ser Ser His Ser Ser Asn Met Ala Asn Thr Gln	
15 20 25 30	
atg aaa tca gac aaa atc att att gct cac cgt ggt gct agc ggt tat	204
Met Lys Ser Asp Lys Ile Ile Ile Ala His Arg Gly Ala Ser Gly Tyr	
35 40 45	
tta cca gag cat acg tta gaa tct aaa gca ctt gcg ttt gca caa cag	252
Leu Pro Glu His Thr Leu Glu Ser Lys Ala Leu Ala Phe Ala Gln Gln	
50 55 60	
gct gat tat tta gag caa gat tta gca atg act aag gat ggt cgt tta	300
Ala Asp Tyr Leu Glu Gln Asp Leu Ala Met Thr Lys Asp Gly Arg Leu	
65 70 75	
gtg gtt att cac gat cac ttt tta gat ggc ttg act gat gtt gcg aaa	348
Val Val Ile His Asp His Phe Leu Asp Gly Leu Thr Asp Val Ala Lys	
80 85 90	
aaa ttc cca cat cgt cat cgt aaa gat ggc cgt tac tat gtc atc gac	396
Lys Phe Pro His Arg His Arg Lys Asp Gly Arg Tyr Tyr Val Ile Asp	
95 100 105 110	
ttt acc tta aaa gaa att caa agt tta gaa atg aca gaa aac ttt gaa	444
Phe Thr Leu Lys Glu Ile Gln Ser Leu Glu Met Thr Glu Asn Phe Glu	
115 120 125	
acc aaa gat ggc aaa caa gcg caa gtt tat cct aat cgt ttc cct ctt	492
Thr Lys Asp Gly Lys Gln Ala Gln Val Tyr Pro Asn Arg Phe Pro Leu	
130 135 140	
tgg aaa tca cat ttt aga att cat acc ttt gaa gat gaa att gaa ttt	540
Trp Lys Ser His Phe Arg Ile His Thr Phe Glu Asp Glu Ile Glu Phe	
145 150 155	
atc caa ggc tta gaa aaa tcc act ggc aaa aaa gta ggg att tat cca	588
Ile Gln Gly Leu Glu Lys Ser Thr Gly Lys Lys Val Gly Ile Tyr Pro	
160 165 170	
gaa atc aaa gca cct tgg ttc cac cat caa aat ggt aaa gat att gct	636
Glu Ile Lys Ala Pro Trp Phe His His Gln Asn Gly Lys Asp Ile Ala	
175 180 185 190	
gct gaa acg ctc aaa gtg tta aaa aaa tat ggc tat gat aag aaa acc	684
Ala Glu Thr Leu Lys Val Leu Lys Lys Tyr Gly Tyr Asp Lys Lys Thr	
195 200 205	
gat atg gtt tac tta caa act ttc gat ttt aat gaa tta aaa cgt atc	732
Asp Met Val Tyr Leu Gln Thr Phe Asp Phe Asn Glu Leu Lys Arg Ile	
210 215 220	

aaa acg gaa tta ctt cca caa atg gga atg gat ttg aaa tta gtt caa	780
Lys Thr Glu Leu Leu Pro Gln Met Gly Met Asp Leu Lys Leu Val Gln	
225 230 235	
tta att gct tat aca gat tgg aaa gaa aca caa gaa aaa gac cca aag	828
Leu Ile Ala Tyr Thr Asp Trp Lys Glu Thr Gln Glu Lys Asp Pro Lys	
240 245 250	
ggt tat tgg gta aac tat aat tac gat tgg atg ttt aaa cct ggt gca	876
Gly Tyr Trp Val Asn Tyr Asn Tyr Asp Trp Met Phe Lys Pro Gly Ala	
255 260 265 270	
atg gca gaa gtg gtt aaa tat gcc gat ggt gtt ggc cca ggt tgg tat	924
Met Ala Glu Val Val Lys Tyr Ala Asp Gly Val Gly Pro Gly Trp Tyr	
275 280 285	
atg tta gtt aat aaa gaa gaa tcc aaa cct gat aat att gtg tac act	972
Met Leu Val Asn Lys Glu Glu Ser Lys Pro Asp Asn Ile Val Tyr Thr	
290 295 300	
ccg ttg gta aaa gaa ctt gca caa tat aat gtg gaa gtg cat cct tac	1020
Pro Leu Val Lys Glu Leu Ala Gln Tyr Asn Val Glu Val His Pro Tyr	
305 310 315	
acc gtg cgt aaa gat gca ctg ccc gag ttt ttc aca gac gta aat caa	1068
Thr Val Arg Lys Asp Ala Leu Pro Glu Phe Phe Thr Asp Val Asn Gln	
320 325 330	
atg tat gat gcc tta ttg aat aaa tca ggg gca aca ggt gta ttt act	1116
Met Tyr Asp Ala Leu Leu Asn Lys Ser Gly Ala Thr Gly Val Phe Thr	
335 340 345 350	
gat ttc cca gat act ggc gtg gaa ttc tta aaa gga ata aaa tcc atg	1164
Asp Phe Pro Asp Thr Gly Val Glu Phe Leu Lys Gly Ile Lys Ser Met	
355 360 365	
gat ggc ggt aaa gca ggt gtt gct tta gtt cgt tct gac tat aaa ttg	1212
Asp Gly Gly Lys Ala Gly Val Ala Leu Val Arg Ser Asp Tyr Lys Leu	
370 375 380	
tac aat aaa aat agt agt agt aat agt act ctt aaa aac cta ggc gaa	1260
Tyr Asn Lys Asn Ser Ser Ser Asn Ser Thr Leu Lys Asn Leu Gly Glu	
385 390 395	
cat cac aga gca cgt gcc atg gat ggt ggc aaa gca ggt gtt gct tta	1308
His His Arg Ala Arg Ala Met Asp Gly Gly Lys Ala Gly Val Ala Leu	
400 405 410	
gta cgt tct gat tat aaa ttt tat gaa gat gca aac ggt act cgt gac	1356
Val Arg Ser Asp Tyr Lys Phe Tyr Glu Asp Ala Asn Gly Thr Arg Asp	
415 420 425 430	
cac aag aaa ggt cgt cac aca gca cgt act agt ggc cac cat cac cat	1404
His Lys Lys Gly Arg His Thr Ala Arg Thr Ser Gly His His His His	
435 440 445	
cac cat t aatctagaat cgataagctt cgaccgatgc c	1442
His His	

<210> 79  
 <211> 448  
 <212> PRT  
 <213> Haemophilus influenzae - see Figure 4

<400> 79

Met	Asp	Pro	Lys	Thr	Leu	Ala	Leu	Ser	Leu	Leu	Ala	Ala	Gly	Val	Leu	1	5	10	15
Ala	Gly	Cys	Ser	Ser	His	Ser	Ser	Asn	Met	Ala	Asn	Thr	Gln	Met	Lys	20	25	30	
Ser	Asp	Lys	Ile	Ile	Ile	Ala	His	Arg	Gly	Ala	Ser	Gly	Tyr	Leu	Pro	35	40	45	
Glu	His	Thr	Leu	Glu	Ser	Lys	Ala	Leu	Ala	Phe	Ala	Gln	Gln	Ala	Asp	50	55	60	
Tyr	Leu	Glu	Gln	Asp	Leu	Ala	Met	Thr	Lys	Asp	Gly	Arg	Leu	Val	Val	65	70	75	80
Ile	His	Asp	His	Phe	Leu	Asp	Gly	Leu	Thr	Asp	Val	Ala	Lys	Lys	Phe	85	90	95	
Pro	His	Arg	His	Arg	Lys	Asp	Gly	Arg	Tyr	Tyr	Val	Ile	Asp	Phe	Thr	100	105	110	
Leu	Lys	Glu	Ile	Gln	Ser	Leu	Glu	Met	Thr	Glu	Asn	Phe	Glu	Thr	Lys	115	120	125	
Asp	Gly	Lys	Gln	Ala	Gln	Val	Tyr	Pro	Asn	Arg	Phe	Pro	Leu	Trp	Lys	130	135	140	
Ser	His	Phe	Arg	Ile	His	Thr	Phe	Glu	Asp	Glu	Ile	Glu	Phe	Ile	Gln	145	150	155	160
Gly	Leu	Glu	Lys	Ser	Thr	Gly	Lys	Lys	Val	Gly	Ile	Tyr	Pro	Glu	Ile	165	170	175	
Lys	Ala	Pro	Trp	Phe	His	His	Gln	Asn	Gly	Lys	Asp	Ile	Ala	Ala	Glu	180	185	190	
Thr	Leu	Lys	Val	Leu	Lys	Lys	Tyr	Gly	Tyr	Asp	Lys	Lys	Thr	Asp	Met	195	200	205	
Val	Tyr	Leu	Gln	Thr	Phe	Asp	Phe	Asn	Glu	Leu	Lys	Arg	Ile	Lys	Thr	210	215	220	
Glu	Leu	Leu	Pro	Gln	Met	Gly	Met	Asp	Leu	Lys	Leu	Val	Gln	Leu	Ile	225	230	235	240
Ala	Tyr	Thr	Asp	Trp	Lys	Glu	Thr	Gln	Glu	Lys	Asp	Pro	Lys	Gly	Tyr	245	250	255	
Trp	Val	Asn	Tyr	Asn	Tyr	Asp	Trp	Met	Phe	Lys	Pro	Gly	Ala	Met	Ala	260	265	270	
Glu	Val	Val	Lys	Tyr	Ala	Asp	Gly	Val	Gly	Pro	Gly	Trp	Tyr	Met	Leu	275	280	285	
Val	Asn	Lys	Glu	Glu	Ser	Lys	Pro	Asp	Asn	Ile	Val	Tyr	Thr	Pro	Leu	290	295	300	
Val	Lys	Glu	Leu	Ala	Gln	Tyr	Asn	Val	Glu	Val	His	Pro	Tyr	Thr	Val	305	310	315	320
Arg	Lys	Asp	Ala	Leu	Pro	Glu	Phe	Phe	Thr	Asp	Val	Asn	Gln	Met	Tyr	325	330	335	
Asp	Ala	Leu	Leu	Asn	Lys	Ser	Gly	Ala	Thr	Gly	Val	Phe	Thr	Asp	Phe	340	345	350	
Pro	Asp	Thr	Gly	Val	Glu	Phe	Leu	Lys	Gly	Ile	Lys	Ser	Met	Asp	Gly	355	360	365	
Gly	Lys	Ala	Gly	Val	Ala	Leu	Val	Arg	Ser	Asp	Tyr	Lys	Leu	Tyr	Asn	370	375	380	
Lys	Asn	Ser	Ser	Ser	Asn	Ser	Thr	Leu	Lys	Asn	Leu	Gly	Glu	His	His	385	390	395	400
Arg	Ala	Arg	Ala	Met	Asp	Gly	Gly	Lys	Ala	Gly	Val	Ala	Leu	Val	Arg	405	410	415	
Ser	Asp	Tyr	Lys	Phe	Tyr	Glu	Asp	Ala	Asn	Gly	Thr	Arg	Asp	His	Lys	420	425	430	
Lys	Gly	Arg	His	Thr	Ala	Arg	Thr	Ser	Gly	His	His	His	His	His	His				

<210> 80  
 <211> 1490  
 <212> DNA  
 <213> Haemophilus influenzae - see Figure 5

<220>  
 <221> CDS  
 <222> (67)...(1458)

<400> 80

ctcttacaca ttccagccct gaaaaagggc atcaaattaa accacacctt aaggaggata	60
taacat atg gat cca aaa act tta gcc ctt tct tta tta gca gct ggc	108
Met Asp Pro Lys Thr Leu Ala Leu Ser Leu Leu Ala Ala Gly	
1 5 10	
gta cta gca ggt tgt agc agc cat tca tca aat atg gcg aat acc caa	156
Val Leu Ala Gly Cys Ser Ser His Ser Ser Asn Met Ala Asn Thr Gln	
15 20 25 30	
atg aaa tca gac aaa atc att att gct cac cgt ggt gct agc ggt tat	204
Met Lys Ser Asp Lys Ile Ile Ile Ala His Arg Gly Ala Ser Gly Tyr	
35 40 45	
tta cca gag cat acg tta gaa tct aaa gca ctt gcg ttt gca caa cag	252
Leu Pro Glu His Thr Leu Glu Ser Lys Ala Leu Ala Phe Ala Gln Gln	
50 55 60	
gct gat tat tta gag caa gat tta gca atg act aag gat ggt cgt tta	300
Ala Asp Tyr Leu Glu Gln Asp Leu Ala Met Thr Lys Asp Gly Arg Leu	
65 70 75	
gtg gtt att cac gat cac ttt tta gat ggc ttg act gat gtt gcg aaa	348
Val Val Ile His Asp His Phe Leu Asp Gly Leu Thr Asp Val Ala Lys	
80 85 90	
aaa ttc cca cat cgt cat cgt aaa gat ggc cgt tac tat gtc atc gac	396
Lys Phe Pro His Arg His Arg Lys Asp Gly Arg Tyr Tyr Val Ile Asp	
95 100 105 110	
ttt acc tta aaa gaa att caa agt tta gaa atg aca gaa aac ttt gaa	444
Phe Thr Leu Lys Glu Ile Gln Ser Leu Glu Met Thr Glu Asn Phe Glu	
115 120 125	
acc aaa gat ggc aaa caa gcg caa gtt tat cct aat cgt ttc cct ctt	492
Thr Lys Asp Gly Lys Gln Ala Gln Val Tyr Pro Asn Arg Phe Pro Leu	
130 135 140	
tgg aaa tca cat ttt aga att cat acc ttt gaa gat gaa att gaa ttt	540
Trp Lys Ser His Phe Arg Ile His Thr Phe Glu Asp Glu Ile Glu Phe	
145 150 155	
atc caa ggc tta gaa aaa tcc act ggc aaa aaa gta ggg att tat cca	588
Ile Gln Gly Leu Glu Lys Ser Thr Gly Lys Lys Val Gly Ile Tyr Pro	
160 165 170	
gaa atc aaa gca cct tgg ttc cac cat caa aat ggt aaa gat att gct	636
Glu Ile Lys Ala Pro Trp Phe His His Gln Asn Gly Lys Asp Ile Ala	
175 180 185 190	

gct gaa acg ctc aaa gtg tta aaa aaa tat ggc tat gat aag aaa acc	684
Ala Glu Thr Leu Lys Val Leu Lys Lys Tyr Gly Tyr Asp Lys Lys Thr	
195 200 205	
gat atg gtt tac tta caa act ttc gat ttt aat gaa tta aaa cgt atc	732
Asp Met Val Tyr Leu Gln Thr Phe Asp Phe Asn Glu Leu Lys Arg Ile	
210 215 220	
aaa acg gaa tta ctt cca caa atg gga atg gat ttg aaa tta gtt caa	780
Lys Thr Glu Leu Leu Pro Gln Met Gly Met Asp Leu Lys Leu Val Gln	
225 230 235	
tta att gct tat aca gat tgg aaa gaa aca caa gaa aaa gac cca aag	828
Leu Ile Ala Tyr Thr Asp Trp Lys Glu Thr Gln Glu Lys Asp Pro Lys	
240 245 250	
ggt tat tgg gta aac tat aat tac gat tgg atg ttt aaa cct ggt gca	876
Gly Tyr Trp Val Asn Tyr Asn Tyr Asp Trp Met Phe Lys Pro Gly Ala	
255 260 265 270	
atg gca gaa gtg gtt aaa tat gcc gat ggt gtt ggc cca ggt tgg tat	924
Met Ala Glu Val Val Lys Tyr Ala Asp Gly Val Gly Pro Gly Trp Tyr	
275 280 285	
atg tta gtt aat aaa gaa gaa tcc aaa cct gat aat att gtg tac act	972
Met Leu Val Asn Lys Glu Glu Ser Lys Pro Asp Asn Ile Val Tyr Thr	
290 295 300	
ccg ttg gta aaa gaa ctt gca caa tat aat gtg gaa gtg cat cct tac	1020
Pro Leu Val Lys Glu Leu Ala Gln Tyr Asn Val Glu Val His Pro Tyr	
305 310 315	
acc gtg cgt aaa gat gca ctg ccc gag ttt ttc aca gac gta aat caa	1068
Thr Val Arg Lys Asp Ala Leu Pro Glu Phe Phe Thr Asp Val Asn Gln	
320 325 330	
atg tat gat gcc tta ttg aat aaa tca ggg gca aca ggt gta ttt act	1116
Met Tyr Asp Ala Leu Leu Asn Lys Ser Gly Ala Thr Gly Val Phe Thr	
335 340 345 350	
gat ttc cca gat act ggc gtg gaa ttc tta aaa gga ata aaa tcc atg	1164
Asp Phe Pro Asp Thr Gly Val Glu Phe Leu Lys Gly Ile Lys Ser Met	
355 360 365	
gat ggc ggt aaa gca ggt gtt gct tta gtt cgt tct gac tat aaa ttg	1212
Asp Gly Gly Lys Ala Gly Val Ala Leu Val Arg Ser Asp Tyr Lys Leu	
370 375 380	
tac aat aaa aat agt agt agt aat agt act ctt aaa aac cta ggc gaa	1260
Tyr Asn Lys Asn Ser Ser Ser Asn Ser Thr Leu Lys Asn Leu Gly Glu	
385 390 395	
cat cac aga gca cgt gcc atg gat ggt ggc aaa gca ggt gtt gct tta	1308
His His Arg Ala Arg Ala Met Asp Gly Gly Lys Ala Gly Val Ala Leu	
400 405 410	
gta cgt tct gat tat aaa ttt tat gaa gat gca aac ggt act cgt gac	1356
Val Arg Ser Asp Tyr Lys Phe Tyr Glu Asp Ala Asn Gly Thr Arg Asp	
415 420 425 430	
cac aag aaa ggt cgt cac aca gca cgt act agt cgt tct gac tat aaa	1404

His Lys Lys Gly Arg His Thr Ala Arg Thr Ser Arg Ser Asp Tyr Lys  
 435 440 445

ttc tac gat aat aaa cgc atc gat agt act agt ggc cac cat cac cat 1452  
 Phe Tyr Asp Asn Lys Arg Ile Asp Ser Thr Ser Gly His His His  
 450 455 460

cac cat taatctagaa tcgataagct tcgaccgatg cc 1490  
 His His

<210> 81

<211> 464

<212> PRT

<213> Haemophilus influenzae - see Figure 5

<400> 81

Met	Asp	Pro	Lys	Thr	Leu	Ala	Leu	Ser	Leu	Leu	Ala	Ala	Gly	Val	Leu
1				5					10					15	
Ala	Gly	Cys	Ser	Ser	His	Ser	Ser	Asn	Met	Ala	Asn	Thr	Gln	Met	Lys
			20					25					30		
Ser	Asp	Lys	Ile	Ile	Ile	Ala	His	Arg	Gly	Ala	Ser	Gly	Tyr	Leu	Pro
		35					40					45			
Glu	His	Thr	Leu	Glu	Ser	Lys	Ala	Leu	Ala	Phe	Ala	Gln	Gln	Ala	Asp
	50					55					60				
Tyr	Leu	Glu	Gln	Asp	Leu	Ala	Met	Thr	Lys	Asp	Gly	Arg	Leu	Val	Val
65					70					75					80
Ile	His	Asp	His	Phe	Leu	Asp	Gly	Leu	Thr	Asp	Val	Ala	Lys	Lys	Phe
				85					90					95	
Pro	His	Arg	His	Arg	Lys	Asp	Gly	Arg	Tyr	Tyr	Val	Ile	Asp	Phe	Thr
			100					105					110		
Leu	Lys	Glu	Ile	Gln	Ser	Leu	Glu	Met	Thr	Glu	Asn	Phe	Glu	Thr	Lys
		115					120					125			
Asp	Gly	Lys	Gln	Ala	Gln	Val	Tyr	Pro	Asn	Arg	Phe	Pro	Leu	Trp	Lys
	130					135					140				
Ser	His	Phe	Arg	Ile	His	Thr	Phe	Glu	Asp	Glu	Ile	Glu	Phe	Ile	Gln
145					150					155					160
Gly	Leu	Glu	Lys	Ser	Thr	Gly	Lys	Lys	Val	Gly	Ile	Tyr	Pro	Glu	Ile
			165						170					175	
Lys	Ala	Pro	Trp	Phe	His	His	Gln	Asn	Gly	Lys	Asp	Ile	Ala	Ala	Glu
			180					185					190		
Thr	Leu	Lys	Val	Leu	Lys	Lys	Tyr	Gly	Tyr	Asp	Lys	Lys	Thr	Asp	Met
		195					200					205			
Val	Tyr	Leu	Gln	Thr	Phe	Asp	Phe	Asn	Glu	Leu	Lys	Arg	Ile	Lys	Thr
	210					215					220				
Glu	Leu	Leu	Pro	Gln	Met	Gly	Met	Asp	Leu	Lys	Leu	Val	Gln	Leu	Ile
225					230					235					240
Ala	Tyr	Thr	Asp	Trp	Lys	Glu	Thr	Gln	Glu	Lys	Asp	Pro	Lys	Gly	Tyr
			245						250					255	
Trp	Val	Asn	Tyr	Asn	Tyr	Asp	Trp	Met	Phe	Lys	Pro	Gly	Ala	Met	Ala
		260						265					270		
Glu	Val	Val	Lys	Tyr	Ala	Asp	Gly	Val	Gly	Pro	Gly	Trp	Tyr	Met	Leu
		275					280					285			
Val	Asn	Lys	Glu	Glu	Ser	Lys	Pro	Asp	Asn	Ile	Val	Tyr	Thr	Pro	Leu
	290					295					300				
Val	Lys	Glu	Leu	Ala	Gln	Tyr	Asn	Val	Glu	Val	His	Pro	Tyr	Thr	Val
305					310					315					320
Arg	Lys	Asp	Ala	Leu	Pro	Glu	Phe	Phe	Thr	Asp	Val	Asn	Gln	Met	Tyr
			325						330					335	
Asp	Ala	Leu	Leu	Asn	Lys	Ser	Gly	Ala	Thr	Gly	Val	Phe	Thr	Asp	Phe

				340					345				350				
Pro	Asp	Thr	Gly	Val	Glu	Phe	Leu	Lys	Gly	Ile	Lys	Ser	Met	Asp	Gly		
			355					360					365				
Gly	Lys	Ala	Gly	Val	Ala	Leu	Val	Arg	Ser	Asp	Tyr	Lys	Leu	Tyr	Asn		
		370				375					380						
Lys	Asn	Ser	Ser	Ser	Asn	Ser	Thr	Leu	Lys	Asn	Leu	Gly	Glu	His	His		
385					390					395					400		
Arg	Ala	Arg	Ala	Met	Asp	Gly	Gly	Lys	Ala	Gly	Val	Ala	Leu	Val	Arg		
				405					410						415		
Ser	Asp	Tyr	Lys	Phe	Tyr	Glu	Asp	Ala	Asn	Gly	Thr	Arg	Asp	His	Lys		
			420					425						430			
Lys	Gly	Arg	His	Thr	Ala	Arg	Thr	Ser	Arg	Ser	Asp	Tyr	Lys	Phe	Tyr		
		435				440						445					
Asp	Asn	Lys	Arg	Ile	Asp	Ser	Thr	Ser	Gly	His	His	His	His	His	His		
	450					455					460						